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ARIZONA DEPARTMENT OF PUBLIC SAFETY

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November 12, 1993

Ms. Donna Searcy
Secretary
Federal Communications Commission
1919 M. St. NW, Room 222
Washington, D.C. 20554

Re: ET Docket No. 93-62 - Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation

Dear Ms. Searcy:

Attached are 9 sets of comments of the State of Arizona, Department of Public Safety to the Commission's proposed rule making on Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (ET Docket 93-62).

These comments reflect the opinion of the Arizona Department of Public Safety (ADPS) and other State Governmental agencies for which ADPS provides radio facilities, engineering, and maintenance services.

Respectfully Submitted,

Ralph I. Gratz, Manager
Telecommunications Division
Arizona Department of Public Safety

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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of:	)	
	)	
Guidelines for	)	
Evaluating the	)	
Environmental	)	ET Docket No. 93-62
Effects of Radio	)	
Frequency Radiation	)	
	)	
	)	

TO: The Commission

COMMENTS OF
THE ARIZONA DEPARTMENT OF PUBLIC SAFETY
for the
STATE OF ARIZONA

INTRODUCTION

The Arizona Department of Public Safety (ADPS) maintains the lead role in State Public Safety communications, pursuant to Arizona Revised Statute 41-1749A. ADPS has queried several of the larger State agencies that are serviced by the Department and has compiled summary data of their comments along with those of ADPS. This data provides the basis for our comments and accurately reflects our position toward the "Guidelines for Evaluating the Environmental Effects of Radio Frequency Radiation described in PR Docket No. 93-62.

BACKGROUND AND DEMOGRAPHICS

The State of Arizona encompasses almost 114,000 square miles. Much of the State is sparsely populated Federal land, with two major population centers, in the Phoenix and Tucson areas. The State currently has over 3.5 million residents. Projections expect the population to increase to 6.5 million people by the year 2000. The population density, however, is still only about 25

persons per square mile. Much of the rapid growth has been concentrated in the two main population centers. Median projections indicate a continuing average growth rate of about 5% annually.

This rapid population growth has generated additional needs for communications facilities. Many existing Statewide radio systems have been significantly enhanced in the last decade with the addition of new VHF, UHF, and 800 MHz repeater channels. New sites have been developed to provide the required coverage necessary on these bands, given presently permissible base and mobile/portable ERP's and site restrictions.

Existing Statewide systems, including those of ADPS, operate from 30 to 50 remote mountaintop sites, with ERP's ranging from 200 to 1,000 watts ERP. Mobile radios for Highway Patrol units, Game and Fish officers, and Parks and Forestry officers operate at ERP levels from 100 to 200 watts, and portable radios operate at from 2 to 6 watts output.

These high-power, mountaintop sites provide a bare minimum of coverage for effective operation of Statewide Public Safety radio systems for various State law enforcement, emergency medical, forestry, wildlife management, and highway maintenance personnel. This is especially critical for use of low-power portable units in the field.

ADPS maintains approximately 150 base/mobile relay stations, 1,500 mobile radios, and 1,000 portable radios for its own statewide systems use. The Department also maintains 55 base/mobile relay stations and 2,000 mobile and portable radios for the Arizona Department of Transportation along with major statewide radio systems for the Arizona Game and Fish

Department, the State Land Department, the State Parks Board, the State Agriculture Department, the State Military Department, and the Arizona Department of Corrections (base/mobile relay stations only).

GENERAL COMMENTARY

The ADPS wishes to comment on many of the Commission's questions concerning implementation of the new ANSI/IEEE C95.1-1992 Standard with respect to "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz." The ADPS does not have sufficient technical expertise to question any of the technical data promulgated in the ANSI/IEEE standard. We accept the exposure standards stated at face value. However, we do question their application to various types of users, and certain circumstances. Therefore, we have addressed certain issues which we feel would greatly impact the operation of Arizona State Government radio systems if implemented in an adverse fashion.

DISCUSSION

The Commission has requested comments under paragraph 13, note 16, on what should constitute the definitions of "controlled" and "uncontrolled" environments. ADPS agrees with the Commission that the less conservative "controlled" approach is warranted when an organization has the means to train its users in proper, safe radio operation. Specifically, ADPS proposes that radio users of a municipal or state agency should all be considered to be in a controlled environment, for both mobile and portable radio operation, because these personnel are of a limited, defined class which can be trained in the proper operation of mobile/portable radio equipment and techniques of avoiding undue RF radiation hazard.

Low Power Devices:

The "controlled" classification is critical to the State governmental agencies to allow their portable radio power to operate at 7 watts ERP below 450 MHz. Otherwise, the State communications system will be rendered unusable for portable radio use. Since the public would be involved only with incidental or transitory exposure from such a portable radio, making this determination would be entirely consistent with the ANSI/IEEE standard.

A related issue is how Effective Radiated Powers (ERP's) are to be defined with a portable radio antenna. Except for true half-wave antennas at 800 MHz, most portable radio antennas are inductively loaded antennas with gains between 0 and -15 dB. This gain varies with frequency, length, manufacturer, band, and location relative to the user's body. Antenna gains are rarely specified by the radio manufacturer. The assumed gain of a portable radio antenna will be critical in determining what the ERP of the portable radio actually is. ADPS recommends that portable radio manufacturers specify ERP for their products. This will help users determine if their radios meet the new FCC requirements.

Paragraphs 15 and 17 of the Docket negate exclusions based on radiated power for handheld radios used with the radiating structure within 2.5 cm. of the users' body. Consideration is to then be given to specific absorption rate (SAR) as defined for an uncontrolled environment. ADPS requests that the SAR controlled environment levels be used when users generally fall in the controlled environment classification by virtue of operator training. ADPS also feels that radio equipment manufacturers should define actual SAR levels for their products to ensure user compliance.

ADPS has no comments on the most appropriate types of tests or testing equipment to be used by the manufacturers to determine SAR. ADPS asks only that the FCC establish some guidelines and give full faith and credit to manufacturer's tests when done as part of the FCC type-acceptance process.

Existing Categorical Exclusions:

ADPS believes that Land Mobile two-way facilities that are currently categorically excluded, already comply with the requirements of the new standards. Typically, Land Mobile transmitter antennas at remote sites are elevated on towers to the levels proposed in the new standard for an uncontrolled environment. With gain antennas, the vertical radiated power is further reduced, and meets the intent of the standard to prevent dangerous radiation to technical personnel working at the ground level. ADPS recommends that a table also be defined for "Estimated Minimum Height to Meet ANSI/IEEE Limits for Field Intensity" in a controlled environment.

Exposure to workers on a tower may be minimized with "common sense" procedures that discourage working on an antenna in parallel with an energized operational transmitter antenna. In the event such work cannot be avoided, additional charts and tables should be presented that define maximum exposure times vs ERP levels so as to comply with the maximum permissible levels defined for a controlled environment. These tables should only consider radiated energy from transmitter antennas located on the tower on which the work is performed.

Mobile Radio Operation

Although mobile radio operation is not specifically mentioned in this proceeding, it is obviously of great interest to the Public Safety Land Mobile community. Many VHF and UHF mobile

transmitters operate with transmitter output powers of up to 100 watts and corresponding ERP's of up to 320 watts. Recognizing the radiation hazard potential, ADPS believes that it would be appropriate for the Commission or equipment manufacturers to conduct tests to determine a table of safe transmitter power levels and ERP's for antennas mounted at various locations on a vehicle. The tables should include cowl-mounted and trunk-mounted antennas. ADPS believes that a determination should be made on whether roof mounting provides sufficient isolation to warrant a general exclusion. The tables should reflect consideration for transmitter duty cycle.

Induced and Contact RF Currents:

The new guidelines require exposure evaluation from induced and contact RF currents over the frequency range of 3 KHz to 100 MHz. This frequency band covers the VHF "Low Band" range of Land Mobile communications. ADPS requests that Land Mobile be specifically exempted from this recommendation because of the low power levels involved, as compared to FM broadcast communications. It is obvious that the Commission's concern is related to FM broadcast stations.

Alternative RF Exposure Guidelines

Since the entire docket is built around the new ANSI/IEEE standard, ADPS feels that it would be appropriate to adopt these standards across the board, and not jump to other standards promulgated by other organizations such as the National Council on Radiation Protection and Measurements (NCRP) or the International Radiation Protection Association (IRPA). The differences in the microwave allowable exposure are only a factor of two, not an order of magnitude or more. Therefore, we feel that full use of the ANSI/IEEE standard is appropriate at microwave frequencies.

Effective Date and Other Issues:

The new Rules, and Standards will require changes in the way some Commission functions are done. This will undoubtedly require changed or additional paperwork on licenses, construction permits, or other forms. In order to have time to promulgate the new rules with its new forms and standards and for manufacturer's to meet any required testing of their equipment, ADPS recommends an implementation date of not sooner than one year after the final Report and Order.

With respect to Section 26, ADPS feels that there is no need to change existing environmental assessments at the time of application or renewal for licensees in the Public Safety Land Mobile services. As mentioned previously, ADPS believes that Land Mobile two-way facilities that are currently categorically excluded, already comply with the requirements of the new standards.

Measurement Procedures and Related Issues:

Most Public Safety Land-Mobile users do not have the equipment or expertise to make detailed quantitative measurements of exposure. ADPS feels that the burden of this requirement should fall on the shoulders of equipment manufacturers.

SUMMARY:

In summary, ADPS makes the following recommendations relative to the new ANSI/IEEE RF Exposure Standard implementation on Public Safety Land-Mobile services:

1. ADPS proposes that radio users of a municipal or state agency should all be considered to be in a controlled environment, for both mobile and portable radio operation, because these personnel are of a limited, defined class which can be trained in the proper operation of mobile/portable radio equipment and techniques of avoiding undue RF radiation hazard.
2. For situations where the radiating structure is within 2.5 cm. of the user's body, ADPS requests that the SAR controlled environment levels be used when users generally fall in the controlled environment classification by virtue of operator training.
3. ADPS recommends that radio equipment manufacturers specify ERP and SAR levels for their products. This will help users determine if their radios meet the new FCC requirements. The burden of the requirement to make quantitative measurements of exposure should fall on the shoulders of equipment manufacturers.
4. ADPS believes that Land Mobile two-way facilities that are currently categorically excluded, already comply with the requirements of the new standards.
5. To address the mobile radio environment, ADPS believes that it would be appropriate for the Commission or equipment manufacturers to conduct tests to determine a table of safe transmitter power levels and ERP's for antennas mounted at various locations on a vehicle. The tables should reflect consideration for transmitter duty cycle. A determination should also be made on whether roof mounting provides sufficient isolation to warrant a general exclusion.
6. For exposure evaluation from induced and contact RF currents, ADPS requests that Land Mobile be specifically exempted from this recommendation because of the low-power levels involved, as compared to FM broadcast communications.
7. ADPS recommends the implementation date of the new rules be not sooner than one year after the final Report and Order.

8. ADPS feels that there is no need to change existing environmental assessments at the time of application or renewal for licensees in the Public Safety Land Mobile services because ADPS believes that Land Mobile two-way facilities that are currently categorically excluded, already comply with the requirements of the new standards. ADPS does recommend that an additional table be defined for "Estimated Minimum Height to Meet ANSI/IEEE Limits for Field Intensity" in a controlled environment.

Respectfully Submitted,

Ralph I. Gratz, Manager
Telecommunications Division
Arizona Department of Public Safety

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